Listing of Claims

This listing of claims will replace all prior listings of claims in the application:

1.   (Original) A method for generating bump map data substantially in real time for use in a 3-dimensional computer graphics system comprising the steps of:

receiving data defining an area to which a texture is to be applied;

receiving texture data to apply to the area, the data including surface height data;

filtering each of a set of partially overlapping samples of the texture data;

deriving surface tangent vectors from the filtered samples; and

deriving a bump map surface normal from the surface tangent vectors.

2.   (Original) A method according to claim 1 in which the tangent vectors are defined in local tangent space.

3.   (Currently Amended) A method according to claim 1, ~~or 2~~ in which the filtering step includes the step of using bi-quadratic B-splines to model a height surface from the surface height data.

4.   (Currently Amended) A method according to ~~claims 1, 2, or 3~~ claim 1, in which the filtering step includes the step of using existing hardware in the colour channels of the 3D graphics system to filter the overlapping samples of texture data.

5.   (Original) A method according to claim 3 in which the filtering step is modified with blending factors.

6. (Original) Apparatus for generating bump map data substantially in real time for use in a 3-dimensional computer graphics system comprising:

means for receiving data defining an area to which a texture is to be applied;

means for receiving texture data to apply to the area, the data including height data;

means for filtering each of a set of partially overlapping samples of the texture data;

means for deriving surface tangent vectors from the filtered samples; and

means for deriving a bump map surface normal from the surface tangent vectors.

7. (Original) Apparatus according to claim 6 in which the step of tangent vectors are defined in local tangent space.

8. (Currently Amended) Apparatus according to claim 6 ~~or 7~~ in which the filtering means comprises a means to use bi-quadratic B-splines to model height surface from the surface height data.

9. (Currently Amended) Apparatus according to ~~claims 6, 7, or 8~~ claim 6, in which the filtering means includes means to use existing hardware in the colour channels of the 3D graphics system to filter the overlapping samples of texture data.

10. (Original) Apparatus according to claim 8 in which the filtering modifies the filtering with blending factors.

11. (Original) A 3D graphics system comprising a plurality of colour data processing means for generating data for use in shading an image to be represented by the 3D graphics system;

means for supplying texture data to be applied to the image; and

means for assigning the colour data processing means to the generation of bump map data for use in applying the texture data to the image.

12. (Cancelled).

13. (Cancelled).

14. (Original) A method for generating bump map data for use in a 3-dimensional computer graphics system comprising the steps of:

receiving data defining an area to which a texture is to be applied;

receiving texture data to apply to the area, the data including surface height data;

filtering each of a set of partially overlapping samples of the texture data;

deriving surface tangent vectors from the filtered samples; and

deriving a bump map surface normal from the surface tangent vectors.

15. (Original) Apparatus for generating bump map data for use in a 3-dimensional computer graphics system comprising:

means for receiving data defining an area to which a texture is to be applied;

means for receiving texture data to apply to the area, the data including height data;

means for filtering each of a set of partially overlapping samples of the texture data;

means for deriving surface tangent vectors from the filtered samples; and

means for deriving a bump map surface normal from the surface tangent vectors.